WHAT IS CLAIMED IS:

[c1] A composition of matter suitable for use as a permanent magnet comprising a rare earth – transition metal – boron alloy, wherein at least 30 weight percent of the rare earth content of the alloy comprises Pr, at least 50 weight percent of the transition metal content of the alloy comprises Fe, and the alloy contains less than 0.6 weight percent oxygen.

[c2] The composition of claim 1, wherein the alloy contains greater than zero but less than 0.6 weight percent oxygen.

[c3] The composition of claim 2, wherein the rare earth – transition metal – boron alloy comprises in atomic percent a $RE_{13-19}B_{4-20}M_{61-83}$ alloy with the balance impurities and oxygen, where RE is the rare earth and M is the transition metal.

[c4] The composition of claim 3, wherein the composition comprises a magnetized permanent magnet.

[c5] The composition of claim 3, wherein the composition comprises an unmagnetized precursor composition which is adapted to be a permanent magnet when magnetized.

[c6] The composition of claim 3, wherein RE comprises at least 50 atomic percent Pr with an effective amount of Nd and at least one light rare earth element selected from the group consisting of Ce, La, Y and mixtures thereof.

[c7] The composition of claim 6, wherein the alloy comprises between about 0.1 and about 0.2 weight percent oxygen.

[c8] The composition of claim 7, wherein:

RE comprises about 50 to about 90 atomic percent Pr, about 9.5 to about 45 atomic percent Nd and about 0.5 to about 5 atomic percent Ce; and

M comprises between about 80 and about 99 atomic percent Fe and between about 0.5 to about 20 atomic percent Co.

[c9] The composition of claim 8, wherein the alloy is capable of remaining substantially corrosion free for at least four years at atmospheric ambient in an uncoated state.

[c10] The composition of claim 4, wherein:

M comprises between 75 and 100 atomic Fe; and

the alloy comprises at least 80 weight percent of a $RE_2Fe_{14}B$ phase having a tetragonal crystal structure.

[c11] The composition of claim 4, wherein the permanent magnet is located in a motor.

[c12] The composition of claim 4, wherein the permanent magnet is located in a generator.

[c13] An MRI system comprising a yoke and at least one permanent magnet having a composition of claim 4 attached to the yoke.

[c14] A magnetic resonance imaging (MRI) system, comprising:

a yoke comprising a first portion, a second portion and at least one third portion connecting the first and the second portion such that an imaging volume is formed between the first and the second yoke portions;

a first magnet assembly attached to the first yoke portion; and

a second magnet assembly attached to the second yoke portion;

wherein the first magnet assembly comprises:

a first permanent magnet body comprising a rare earth – transition metal – boron alloy, wherein at least 30 weight percent of the rare earth content of the alloy comprises Pr, at least 50 weight percent

of the transition metal content of the alloy comprises Fe, and the alloy contains less than 0.6 weight percent oxygen, the first permanent magnet body having a first surface and a stepped second surface facing the imaging volume; and

at least one first layer of soft magnetic material located between the first yoke portion and the first surface of the first permanent magnet body.

[c15] The system of claim 14, further comprising a second magnet assembly attached to the second yoke portion, wherein the second magnet assembly comprises:

a second permanent magnet body comprising a rare earth – transition metal – boron alloy, wherein at least 30 weight percent of the rare earth content of the alloy comprises Pr, at least 50 weight percent of the transition metal content of the alloy comprises Fe, and the alloy contains less than 0.6 weight percent oxygen, the second permanent magnet body having a first surface and a stepped second surface facing the imaging volume; and

at least one second layer of soft magnetic material located between the second yoke portion and the first surface of the second permanent magnet body.

[c16] The system of claim 15, wherein:

the at least one first layer of a soft magnetic material comprises a first laminate of Fe-Si, Fe-Al, Fe-Co, Fe-Ni, Fe-Al-Si, Fe-Co-V, Fe-Cr-Ni or amorphous Fe- or Co-base alloy layers; and

the at least one second layer of a soft magnetic material comprises a second laminate of Fe-Si, Fe-Al, Fe-Co, Fe-Ni, Fe-Al-Si, Fe-Co-V, Fe-Cr-Ni or amorphous Fe- or Co-base alloy layers.

[c17] The system of claim 16, wherein the first permanent magnet body comprises:

a base section having a major first surface attached to the at least one first layer of a soft magnetic material; and

a hollow ring section over a second surface of the base section, where the second surface of the base section is opposite to the first surface of the base section.

[c18] The system of claim 17, wherein:

the system does not contain a pole piece or a gradient coil between the second surface of the first permanent magnet body and the imaging volume and between the imaging volume and the second surface of the second permanent magnet body; and

the system further comprises an RF coil and an image processor.

[c19] The system of claim 18, wherein:

the rare earth – transition metal – boron alloy in the first and in the second permanent magnet body comprises in atomic percent a $RE_{13-19}B_{4-20}M_{61-83}$ alloy with the balance impurities and oxygen, where RE is the rare earth and M is the transition metal; and

the alloy contains greater than zero but less than 0.6 weight percent oxygen.

[c20] The system of claim 19, wherein:

RE comprises about 50 to about 90 atomic percent Pr, about 10 to about 45 atomic percent Nd and about 0 to about 5 atomic percent Ce;

M comprises between about 80 and about 100 atomic percent Fe and between about 0 to about 20 atomic percent Co; and

the alloy comprises between about 0.1 and about 0.2 weight percent oxygen and at least about 80 weight percent of a $RE_2Fe_{14}B$ phase having a tetragonal crystal structure.

[c21] A method of making an MRI device, comprising:

providing a yoke comprising a first portion, a second portion and at least one third portion connecting the first and the second portions such that an imaging volume is formed between the first and the second yoke portions;

attaching a first precursor body to the first yoke portion;

attaching a second precursor body to the second yoke portion;

magnetizing the first precursor body to form a first permanent magnet body after the step of attaching the first precursor body; and

magnetizing the second precursor body to form a second permanent magnet body after the step of attaching the second precursor body;

wherein the first and the second precursor bodies comprise a rare earth – transition metal – boron alloy, wherein at least 30 weight percent of the rare earth content of the alloy comprises Pr, at least 50 weight percent of the transition metal content of the alloy comprises Fe, and the alloy contains less than 0.6 weight percent oxygen.

[c22] The method of claim 21, wherein:

the step of magnetizing the first precursor body comprises placing a coil around the first precursor body; applying a pulsed magnetic field to the first precursor body to form at least one first permanent magnet body; and removing the coil from the first permanent magnet body; and

the step of magnetizing the second precursor body comprises placing a coil around the second precursor body; applying a pulsed magnetic field to the

second precursor body to form at least one second permanent magnet body; and removing the coil from around the second permanent magnet body.

[c23] The method of claim 22, wherein:

the first and the second precursor bodies comprise assemblies of plurality of unmagnetized rare earth – transition metal – boron alloy blocks; and

the pulsed magnetic field comprises a magnetic field of at least 2.5 Tesla.

[c24] The method of claim 23, further comprising:

placing the plurality of unmagnetized alloy blocks on a support prior to the step of attaching the first precursor body;

placing a cover over the blocks;

shaping the blocks to form the first precursor body prior to removing the cover and the support;

removing the cover from the first precursor body;

providing an adhesive material to adhere the blocks of the first precursor body to each other; and

removing the support from the first precursor body.

[c25] The method of claim 21, further comprising attaching at least one layer of a soft magnetic material between the first precursor body and the first yoke portion.

[c26] The method of claim 21, wherein:

the rare earth – transition metal – boron alloy comprises in atomic percent a $RE_{13\text{-}19}B_{4\text{-}20}M_{61\text{-}83}$ alloy with the balance impurities and oxygen, where RE is the rare earth and M is the transition metal; and

the alloy contains greater than zero but less than 0.6 weight percent oxygen.

[c27] The method of claim 26, wherein:

RE comprises about 50 to about 90 atomic percent Pr, about 10 to about 45 atomic percent Nd and about 0 to about 5 atomic percent Ce;

M comprises between about 80 and about 100 atomic percent Fe and between about 0 to about 20 atomic percent Co; and

the alloy comprises between about 0.1 and about 0.2 weight percent oxygen and at least about 80 weight percent of a $RE_2Fe_{14}B$ phase having a tetragonal crystal structure.

[c28] The method of claim 21, where the step of magnetizing the first precursor body is carried out at a temperature above room temperature.

[c29] The method of claim 21, further comprising subjecting the first permanent magnet body to a recoil pulse after the step of magnetizing the first precursor body to form the first permanent magnet body.

[c30] A method of making a permanent magnet comprising:

providing a rare earth – transition metal – boron alloy precursor powder;

compressing the precursor powder into a green body while applying a magnetic field;

compacting and sintering the green body to form a sintered intermetallic block; and

magnetizing the sintered intermetallic block to form a permanent magnet block comprising a rare earth – transition metal – boron alloy, wherein at least 30 weight percent of the rare earth content of the alloy comprises Pr, at least 50

weight percent of the transition metal content of the alloy comprises Fe, and the alloy contains less than 0.6 weight percent oxygen.

[c31] The method of claim 30, further comprising attaching the permanent magnet block to a yoke portion of an imaging system after the step of magnetizing the sintered intermetallic block.

[c32] The method of claim 30, further comprising attaching the sintered intermetallic block to a yoke portion of an imaging system prior to the step of magnetizing the sintered intermetallic block.

[c33] The method of claim 30, wherein the rare earth – transition metal – boron alloy comprises in atomic percent a $RE_{13-19} B_{4-20} M_{61-83}$ alloy with the balance impurities and oxygen, where RE is the rare earth, M is the transition metal, and the alloy contains greater than zero but less than 0.6 weight percent oxygen.

[c34] A method of making a motor or a generator device, comprising:

providing a motor or a generator device;

attaching a first precursor body comprising at least one unmagnetized alloy block to the device; and

magnetizing the at least one unmagnetized alloy block to form a first permanent magnet body after the step of attaching the first precursor body.

[c35] The method of claim 34, wherein the at least one unmagnetized alloy block comprise a rare earth – transition metal – boron alloy, wherein at least 30 weight percent of the rare earth content of the alloy comprises Pr, at least 50 weight percent of the transition metal content of the alloy comprises Fe, and the alloy contains less than 0.6 weight percent oxygen.

[c36] The method of claim 34, wherein the device is a motor.

[c37] The method of claim 34, wherein the device is a generator.